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OBITUARY NOTICE

OF

MARTINUS WILLEM BEIJERINCK.

(WITH PORTRAIT.)

1851–1931.

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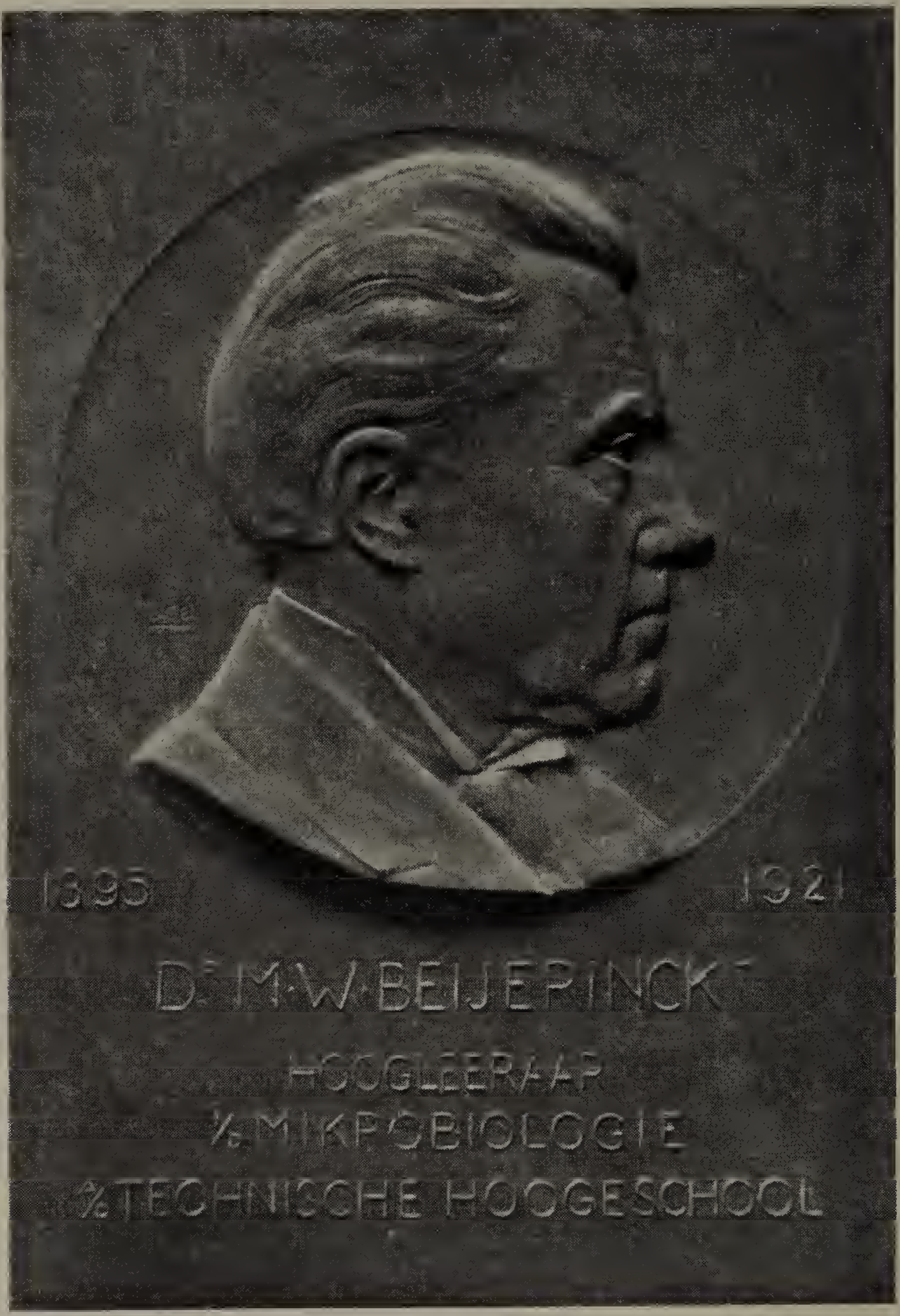

M W Beyerinck

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MARTINUS WILLEM BEIJERINCK—1851–1931.

AT all periods Holland has played a conspicuous part in the development of science, and in more than one branch of learning Dutchmen have led the path of advance. The Royal Society has not been wanting in its appreciation of their efforts and honoured names like Huygens, Leeuwenhoek, Ruysch, Boerhaave, Donders, de Vries, van't Hoff, Zeeman and Lorentz will be found on its roll. To this galaxy must be added the name of Martinus Willem Beijerinck, botanist, microbiologist and chemist, who in the course of researches steadfastly prolonged for half a century gave abundant proof of high scientific genius and practical achievement.

Martinus Willem Beijerinck was born in Amsterdam on March 16, 1851, the son of a tobacconist. On the paternal side his grandfather was an engineer of the Waterstaat, while his maternal grandfather was a Protestant pastor and learned theologian. The tobacconist father had the artistic rather than the business temperament, gave up his shop and settled in Haarlem, where he managed to secure a post on the railway. Martinus went to the Hoogere Burgerschool in Haarlem, and early showed such an interest in the wild plants of the surrounding country that at the age of sixteen he received a silver medal from the Dutch Society of Agriculture for an essay on the flora of Kennemerland, and so great had become his love for botany that he thought of adopting it as a career. Financial straits, however, made him look to a more assured future, and in 1869 he entered the Polytechnic Institute at Delft, where, in 1872, he took the diploma of "Chemical Engineer." For a short time he returned to his botanical studies in Leyden, but in 1873 he took up a post as lecturer on botany, physiology and physics at the Agricultural School at Warffum, not far from Groningen.

In 1875 he was lecturer on botany, zoology and geology at the Hoogere Burgerschool at Utrecht, and from there he went in 1876 as lecturer in botany at the Agricultural School at Wageningen, which soon afterwards was transformed into the Rijks hoogere Land-, Tuin- en Boschbouwschool, and there he remained for ten years, during which his great scientific gifts displayed themselves to the full. In 1877 he took the degree of Doctor in Wis- en natuurkunde in Leyden with a dissertation, "Bijdrage tot de morphologie der plantengallen," and he continued to interest himself in this subject for many years.

In 1887 he was offered and accepted the post of microbiologist to the "Nederlandsche Gist-en Spiritusfabriek" in Delft, and, in this small and delightful town of historic, artistic and scientific memories, Beijerinck spent the next thirty-four years of a peaceful and outwardly uneventful life, diligently employing his great talents for the advancement of biological science.

In 1893 he became professor of general bacteriology and, in 1895, of general microbiology at the Technische Hoogeschool in Delft, and there he founded a laboratory which became famous all over the world. Having attained the age of seventy in 1921, he retired from his professorship in Delft, settled in Gorssel, a small town in Gelderland near Deventer, and there he died, deeply regretted, on January 1, 1931, aged seventy-nine. He left instructions that no funeral orations were to be delivered over his remains, which were cremated on January 6.

Between 1877 and 1927 Beijerinck published about 140 scientific researches, each of which contained evidence of original work, and many have become classical. His papers are scattered and appeared in Dutch, French, German and English periodicals. It is fortunate that most of them have been gathered together in a series of five large quarto, closely-printed volumes, published to commemorate his seventieth birthday. This notable publication appeared from Delft in 1921, and is entitled, "Versamelde Geschriften van M. W. Beijerinck ter gelegenheid van zijn 70sten Verjaardag."

In reading through this large work, one is struck not only with Beijerinck's originality but also with the extraordinary range of his observations, for he was equally at home as a botanist, microbiologist, and chemist. The subjects he chose to work at were of great importance, theoretically and practically, and, although they were often of great complexity, he was peculiarly successful in getting at the truth.

In 1877 he published an elaborate work on plant galls, and for this he was early elected a member of the Koninklijke Academie van Wetenschappen. In 1882 he discovered that gummosis in the cambium of Prunaceæ is an infective process caused by the widespread fungus *Coryneum beijerinckii* Oudemans, and with this fungus he succeeded later in obtaining large quantities of gum from the cherry, apricot, plum and especially *Prunus amygdalo-persica.* He also made a number of experiments in crossing different varieties of wheat.

In 1888 he published in German his classical paper, "Die Bacterien der Papilionaceen-Knöllchen," and gave an elaborate and accurate account of the origin, structure, and fate of the nodules. He showed that the process was the result of an infection caused by *Bacillus radicicola,* which he succeeded in cultivating from the nodules.

From about 1889 he began to turn his attention more and more to economic and soil bacteriology, and by his notable contributions made himself the recognised master in this complicated but important branch of bacteriology. By studying the fundamental problems of bacterial nutrition, he was successful in cultivating many bacteria where others had failed, and he was early in the field in investigating several subjects which may be described as all the rage to-day.

Special reference must be made to his extended and beautiful researches on luminous bacteria and the mechanism of luminosity and the respiratory figures of motile bacteria. He brought to light the extraordinary oligonitrophilous and oligocarbophilous bacteria and the important aerobic nitrogen-fixing *Azotobacter chroococcum.* Beijerinck also wrote a great deal on the chemistry of bacterial fermentations and was a successful and early worker on the hereditary variations among bacteria. His researches on enzymes such as lactase, glucase and tyrosinase were elaborate, and he spent much time in the elucidation of the natural indigo-forming process.

In 1898 he described the filter-passing character of the infective agent in the tobacco blight, now called mosaic disease. In this discovery he had been forestalled by Iwanowski, who had reported the filter-passing character of the virus in 1892. Iwanowski's claims were handsomely admitted by Beijerinck in his full account of the subject in his paper, " De l'existence d'un principe contagieux vivant fluide, agent de la nielle des feuilles de tabac," published in 1900.

In the midst of all these strenuous labours, Beijerinck would return to such subjects as the sexual generation of *Cynips Kollari,* the assimilative powers of the chromatophores of diatoms, the influence of very low temperatures on bacteria, the enzyme theory of heredity, crystallised starch and the chemistry of indigo. His interests seemed inexhaustable, and he touched no subject that he did not enrich with his genius and industry. He worked quietly and unobtrusively as the years sped on, but even in his retirement at Gorssel his scientific interest was unabated, and in his last days he was again a botanist working at the mathematics of phyllotaxis.

Judged by the severest standards, Beijerinck's scientific labours and achievements occupy a high place and entitle him to rank alongside the greatest biologists of the twentieth century. In his own country he was held in the highest repute, and was awarded the Leeuwenhoek medal in 1905 by the Koninklijke Akademie van Wetenschappen. In 1922 he received the Emil Christian Hansen medal from Denmark. Beijerinck was an honorary member of many biological societies outside Holland, and he wrote to me that the crowning pleasure of his life was his election as Foreign Member of the Royal Society in 1926.

Besides his great scientific achievements, Beijerinck was a simple and noble character and habitually displayed the most generous instincts, not only towards his own countrymen, but also to foreigners who corresponded with him. To perpetuate his memory a fine bronze plaque with his likeness was placed, in 1921, in the Technische Hoogeschool in Delft, where he taught and laboured so successfully for more than a quarter of a century. This plaque is herewith reproduced.

W. B.

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